

Application for

United States Letters Patent

of

David Teller

for

BEVERAGE DISPENSING CONTROL SYSTEM

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BEVERAGE DISPENSING CONTROL SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to U.S. Provisional Patent Application Serial Number 60/311,366 entitled "Beverage Dispensing Control System" filed on August 13, 2001, the entire disclosures and contents of which are hereby incorporated by reference. This application makes reference to U.S. Application Serial Number 09/768,559 entitled "Beverage Dispensing Control System" filed Jan. 25, 2001, U.S. 10 Patent Application Serial Number 09/733,719, filed on December 8, 2000, and entitled "Service Transaction Monitoring System, Method, and Device," and U.S. Provisional Patent Application Serial Number 60/169,918, filed on December 10, 1999, and entitled "Service Transaction Monitoring System, Method, and Device," the entire disclosures and contents of which are hereby incorporated by reference.

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BACKGROUND OF THE INVENTION

Field of the Invention

20 The present invention relates generally to dispensing control systems.

Description of the Prior Art

25 Businesses, such as fast food restaurants, restaurants, grocery stores, convenience stores, sporting complexes and parks, commonly allow customers to purchase one beverage container that the customer then fills up at a customer accessible beverage dispensing area. The customer then may select from the variety of choices of beverages.

30 Some businesses sell to the customer one beverage container to fill a single time at the beverage dispensing area. Once the customer has filled the beverage container the sale of transaction is complete. In order to ensure the customer does not fill up the beverage container a second time a business would need to employ a

specific employee, as a security guard, or purchase a security system with cameras and monitors to prevent customers from seeking a second unpaid refill. Such measures would generally be considered to be impractical by many businesses.

5 When refills are offered to some customers, then the determination of whether a customer is entitled to dispense a beverage becomes more complex. If the customer, without assistance, dispenses a refill beverage, then the business may have more difficulty in preventing a customer from dispensing refills that are not authorized, *i.e.* the customer did not pay for refills. Although a special container may be used to
10 insure that improper refills are not dispensed, these special containers may require additional monitoring by the employees of the business.

15 One way to control the dispensing of refills is to have refills handled by an employee of the business. However, often employees will not accurately track the number of servings dispensed, nor the number of refill servings dispensed. Thus, the business may have a difficult time in tracking the number of servings that are refills in the course of a business day.

20 Also, some businesses sell a variety of beverages for varying costs at the beverage dispensing area. The customer could purchase a beverage container for one type of beverage and then fill the beverage container up with a more expensive beverage. In order to monitor the customer behavior at the beverage dispensing area the business would have to employ a specific employee, as a security guard, or purchase a security system with cameras and monitors to prevent customers from seeking a second refill. The employee or security system would also have to know in advance which beverage the customer has been authorized to fill at the beverage dispensing area. These methods to prevent this type of customer behavior would result in significant costs for the business. Similar problems as described above could also be present when a business is trying to offer a beverage special.

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SUMMARY OF THE INVENTION

It is an object of the present invention to accurately track the dispensing of refill beverages by a dispensing apparatus.

It is another object of the present invention to prevent unauthorized servings from being dispensed by a dispensing apparatus.

5 It is yet another object of the present invention to provide a method of linking the servings dispensed by a dispensing apparatus to a corresponding bill.

It is yet another object of the present invention to provide a method of controlling the inventory of servings that are dispensed by a dispensing apparatus.

10 It is yet another object of the present invention to provide a method of monitoring employees who are dispensing servings from a dispensing apparatus on behalf of a customer.

15 It is yet another object of the present invention to provide a method of alerting the owner of a dispensing apparatus when the serving that is dispensed does not appear on the bill.

20 It is yet another object of the present invention to provide a method of alerting the owner of a dispensing apparatus when the serving that is dispensed does not correspond with delivery of bulk product from the owner of the dispenser system.

25 It is yet another object of the present invention to provide a method of alerting the owner of the establishment when the dispensing apparatus that dispensed the serving does not appear on the bill.

It is yet another object of the present invention to provide a method of determining when servings that are dispensed are refills.

30 It is yet another object of the present invention to provide a method of determining the person that dispensed the serving.

It is yet another object of the present invention to provide a method of determining the location to which the dispensed serving is being delivered.

It is yet another object of the present invention to provide a method of linking the location, which the dispensed serving is being delivered to, with a location identifier on the bill.

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According to a first broad aspect there is provided a method for controlling the dispensing of at least one serving from a dispensing apparatus comprising the steps of: (a) entering identification information about a user; (b) putting a dispensing apparatus in a ready state based on the identification information; (c) entering first dispensing information about the at least one serving; (d) storing the first dispensing information in a storage medium; (e) linking the first dispensing information with destination information; (f) activating the readied dispensing apparatus based on the first dispensing information to put the dispensing apparatus in an activated state; and (g) dispensing the at least one serving from the activated dispensing apparatus based on the first dispensing information.

According to a second broad aspect there is provided the method for producing a bill for a dispensing system comprising the steps of: (a) a waiter creating the bill by entering destination information into the dispensing system; (b) a server entering identification information, dispensing information and the destination information into the dispensing system; (c) linking the dispensing information to the bill based on the destination information; and (d) producing the bill based on the dispensing information.

According to a third broad aspect there is provided the dispensing apparatus control device, comprising: a means for mounting the control device on a dispensing apparatus; information entry means for entering identification and destination information in the control device; and a means for controlling the activation of the dispensing apparatus on which the control device is mounted.

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According to a fourth broad aspect there is provided the method for monitoring the dispensing of at least one serving from a dispensing container comprising the steps of: (a) entering identification information about at least one user into the dispenser; (b) entering destination information about the at least one serving;

(c) dispensing the at least one serving from the dispensing container; and (d) determining that the at least one serving has been dispensed based on the dispensing container being tilted at least once.

5 Other objects and features of the present invention will be apparent from the following detailed description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The invention will be described in conjunction with the accompanying drawings, in which:

FIG. 1 is a flow chart that illustrates a preferred embodiment of the method of the present invention;

15 FIG. 2 is a flow chart that illustrates another preferred embodiment of the method of a dispensing refill serving of the present invention;

20 FIG. 3 is a flow chart that illustrates yet another preferred embodiment of the method of the present invention;

FIG. 4 is a flow chart that illustrates how a user may enter dispensing information in a preferred embodiment of the method of the present invention;

25 FIG. 5 is a flow chart that illustrates how a dispensing apparatus of the present invention may operate in a preferred embodiment of the method of the present invention;

30 FIG. 6 is a flow chart that illustrates how “point of sale” matching between dispensing information and identification information may be conducted in a preferred embodiment of the method of the present invention;

FIG. 7A is a perspective view of an entry device constructed in accordance with an embodiment of the present invention;

FIG. 7B is a front view of the entry device of FIG. 7A;

5 FIG. 7C is a side view of the entry device of FIG. 7A;

FIG. 8 is a perspective cut-away view of a valve constructed in accordance with an embodiment of the present invention;

10 FIG. 9 is a rear perspective view of an entry device attached to a valve constructed in accordance with an embodiment of the present invention;

15 FIG. 10 is a perspective view of an entry device attached to a valve on a dispensing apparatus constructed in accordance with an embodiment of the present invention;

FIG. 11 is a flow chart that illustrates a matching process of one preferred embodiment of the method of the present invention;

20 FIG. 12A is a perspective view of a dispensing container as constructed in accordance with an embodiment of the present invention; and

FIG. 12B is a cut-away side view of the dispensing container of FIG. 12A.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

25 It is advantageous to define several terms before describing the invention. It should be appreciated that the following definitions are used throughout this application.

Definitions

30 Where the definition of terms departs from the commonly used meaning of the term, applicant intends to utilize the definitions provided below, unless specifically indicated.

For the purposes of the present invention, the term “serving” refers to the allocation of a dispensed product purchased by the user in certain quantity and/or number. For example, in a purchase for two twelve-ounce soft drinks by the user 5 would result in the following: the serving would be twelve ounces in quantity and two soft drinks in number. Dispensed servings may be fungible goods that are solids, liquids, gases, *etc.* and combinations thereof. Examples of servings that are solids include, but are not limited to: coins, sport balls, candies, chips, game pieces, ice cream, office supplies, *etc.* Examples of servings that are liquid include, but are not 10 limited to: soft drinks, coffee, juice teas, sports drinks, frozen flavored ice, alcoholic beverages, fuel, *etc.* Examples of servings that are gases include gases by themselves, such as air, oxygen, helium, or in combination with other servings, such as carbonation with soft drinks. In a preferred embodiment, a serving may refer to a liquid consumable beverage such as coffee or carbonated soda. A serving may also be 15 a “FOR PAY” serving or a “REFILL” serving if marked or flagged as such by the user; dispensing system, or cash register.

For the purposes of the present invention, the term “dispensing apparatus” refers to mechanical device that may hold servings and dispense those servings out 20 through a controlled process, *i.e.* a valve. A dispensing apparatus may be a coffee urn. A dispensing apparatus may also dispense other beverages such as juices, teas, sports drinks, water, frozen flavored ice, alcoholic beverages, *etc.* A dispensing apparatus may also dispense non-beverage liquids such as fuel. A dispensing apparatus may 25 also include non-liquid dispensing servings, such as golf balls, food items, gases, cash, and small game pieces. A dispensing apparatus may be any size, color, shape, *etc.* and have any number or types of valves. A dispensing apparatus may either be automated or manually operated by a user. A dispensing apparatus may be part of a dispensing system.

30 For the purposes of the present invention, the term “multi-dispensing apparatus” refers to dispensing apparatus that consists of more than one dispensing apparatus. A preferred multi-dispensing apparatus may have more than one valve, such as the multiple valves typically used to dispense several beverages. A preferred dispensing apparatus is a beverage stand, such as those typically found in restaurants,

for dispensing soft drinks.

For the purposes of the present invention, the term "identification information" refers to information that identifies a particular user, which may be contained, 5 encoded, stored, *etc.* in, for example, a driver's license, credit card, bar code, magnetic strip, or bio-sensing device, or may be entered, retrieved, or accessed using a PIN, password, code, *etc.* The identification information may also be contained on a cell phone, lab top computer, PDA, *etc.* that would communicate with a host system via a wireless communication link. The identification information puts the dispensing 10 apparatus in a ready state or activates the dispensing apparatus when the identification information is read, scanned, or entered. The identification information may be issued by the business or owners of the dispensing apparatus to the user, or the identification information may be the user's personal item that is fitted, encoded, programmed, *etc.* to be used for the dispensing apparatus. The identification information may be 15 particularly useful when a user is not the consumer of the serving, but instead is delivering the serving to where a user is located. Preferably, the dispensing apparatus may not be activated or put in the activated state until the identification information is read, entered, or activated.

20 For the purposes of the present invention, the term "user" refers to an individual who desires a serving to be dispensed. A user may enter identification information relating to authorization to use a dispensing apparatus or dispensing system. Alternatively, a user may enter destination information, *i.e.* location, prior to 25 or while using a dispensing apparatus or dispensing system. A user enters the desired dispensing information as prompted. A user may be the customer of the business with the dispensing apparatus. Alternatively, a user may be a waiter or server who enters dispensing information on behalf of the customer. When a waiter, server or employee of the business enters dispensing information on behalf of the user, the server or employee enters identification information relating to themselves and not the customer. For example, at a restaurant where customers are waited on at tables, the 30 waiter and/or server would take an order, *i.e.* one or more servings desired by the customer, and then enter the order. To begin the process, the waiter and/or server uses identification information that relates to them.

For the purposes of the present invention, the term “ready state” refers to the dispensing apparatus operational status after identification information has been entered. To place a dispensing apparatus in a ready state, a user preferably enters identification information. Once in the ready state, the dispensing apparatus is ready
5 to dispense a serving provided the dispensing information is entered. The dispensing apparatus will remain in a ready state until dispensing information is entered to indicate that a serving is to be dispensed, the allocated time space is exceeded, or when a user manually takes a dispensing apparatus out of a ready state, *i.e.* for servicing. A preferable sequence position for ready state is between the off or stand-
10 by state and the activated state.

For the purposes of the present invention, a step, method or information is “based” on a particular step, method, or information, if that step, method or information is derived by performing a mathematical calculation or logical decision
15 using that step, method, or information. The information may be identification, dispensing or destination information. For example, the dispensing apparatus is placed in a readied state based on the identification information, *i.e.* the logical condition of accepting valid identification information. An alternative example is when the dispensing apparatus links, matches, reconciles, *etc.* dispensing information
20 based on destination information, *i.e.* the logical condition that a destination information exists for a dispensing information.

For the purposes of the present invention, the term “dispensing information” refers to a variety of data inquiries that the user enters to create the desired serving.
25 Typically, a user or server may enter the dispensing information using a keypad, keyboard, a user-controlled interface, stylus pad or touch screen. A user or server may also enter the dispensing information by scanning, or entering, a bar code or magnetic strip wherein the information is contained. The dispensing information may require a user to enter the quantity of serving to be dispensed. Additionally, the
30 dispensing information may require a user to enter the number of servings to be dispensed. This dispensing information is important to prevent mistake or fraud in having a user receive an unpaid serving that is mistakenly entered as refill servings. The dispensing information may include where the serving is to be dispensed, *i.e.* which dispensing apparatus is to dispense the serving when activated by the

identification medium. This dispensing information is important when a multi-dispensing apparatus is in use within a single business or shopping area or when a dispensing apparatus has several valves. The dispensing information may also include destination information, including location, which may be used to link a dispensing serving to a bill. The dispensing information may also enter the amount and method of payment. The payment may be in the form of a cash transfer, credit or debt charge. In a preferred embodiment of the present invention, if the amount of payment is not entered as dispensing information, the identification information will not activate the dispensing apparatus from a readied state.

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For the purposes of the present invention, the term "storage medium" refers to any magnetic and/or optical memory or data device such as a hard drive, CD-ROM, tape, or any storage device wherein the data contained on or within the memory may be retrieved by electronically accessing the data. Storage medium refers to any processing system that stores information that a user may wish to retrieve. Typically, the storage medium comprises a database. The storage medium may be read/writable, and may be read and written to any number of successive times. The storage medium may store records of the identification information, dispensing information or destination information input by a user.

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For the purposes of the present invention, the term "destination information" refers to the location of the recipient where a serving and/or bill are to be delivered. Typically, the recipient may be the user or customer who will consume the servings. The destination information preferably links the user, with a server, location, and/or amount of payment. The destination information typically is entered when the user enters the dispensing information and may be changed manually, or automatically assigned. The destination information may be generic or specific. For example, destination information may refer to table 101A, or may refer an individual sitting in seat one of table 101A. Thus, a bill for an entire table may be created for several individuals at a table.

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For the purposes of the present invention, the term "activated state" refers to the operational status of a dispensing apparatus after identification information and dispensing information has been entered, in which the dispensing apparatus may

dispense servings. To place a dispensing apparatus in an activated state, a user preferably enters identification information, and dispensing information. Once the dispensing information based on the destination information produce a valid match or authorized serving, the dispensing apparatus is placed from a readied state into an activated state. The dispensing apparatus, in an activated state, may dispense servings. The dispensing apparatus will generally remain in an activated state until the appropriate serving is dispensed, the allocated time space is exceeded, or when a user manually takes a dispensing apparatus out of an activated state, *i.e.* for servicing. A preferable sequence position for activated state is between the ready state and the off or stand-by state.

For the purposes of the present invention, the term “stand-by state” refers to the operational status of a dispensing apparatus before identification information is entered or the operational status after a serving has been dispensed, in which the dispensing apparatus awaits the entry of identification information to be allow to dispense servings.

To place a dispensing apparatus in a stand-by state, a user preferably turns on the dispensing apparatus but does not place it in a ready state, and or takes the dispensing apparatus out of the activated state after the serving is dispensed. The dispensing apparatus, in a stand-by state, may not dispense servings.

The dispensing apparatus will remain in a stand-by state until a user enters identification information, or when a user manually takes a dispensing apparatus out of a stand-by state, *i.e.* for servicing. The dispensing apparatus is in a stand-by state preferably after a serving is dispensing and when a refill serving has been entered as dispensing information. A preferable sequence position for stand-by state is between the off and ready state, or the activated state and ready state.

For the purposes of the present invention, the term “quantity” refers to the amount of a serving to be dispensed. The quantity is entered as dispensing information that is selective from a range that may be determined by the business.

For example, a user who purchases a medium carbonated beverage may receive a business pre-determined quantity, such as twenty fluid ounces for a serving described as “medium.” In the alternative, a user may determine the quantity of serving desired. Typically, the quantity may affect the amount of payment required to complete the transaction by the user.

For the purposes of the present invention, the term “number” refers to the amount of times a serving is dispensed. The number is entered as dispensing information that is selective from a range that may be determined by the business.

5 For examples, a user who purchases one medium carbonated beverage will receive one serving. Additionally, a user may purchase three medium soft drinks and will receive three servings. When a user purchases unlimited refill servings, then the number is determined by the time period that refill servings are authorized. For example, the refill servings may last for the remainder of the business day, *e.g.* a
10 bottom-less pot of coffee ends once the restaurant closes. Typically, the number may affect the amount of payment required to complete the transaction by the user.

For the purposes of the present invention, the term “location” refers to where the serving is to be delivered to upon dispensing the appropriate amount. The location 15 may be entered as dispensing information. Typically, a location will refer to a particular table in a restaurant, such as TABLE 102A, and the seat at that table. The location is part of the destination information entered for a serving. Additionally, a location may refer an area where a server is to bring the desired serving to a user.

20 For the purposes of the present invention, the term “deliver” refers to method of transporting a dispensed serving from the dispensing apparatus to a recipient/user to be consumed. Typically, a server will deliver the serving to a recipient/user at a restaurant on a tray or by hand. The serving may also be delivered automatically by means of a mechanical assembly line. The location may assist the server in locating
25 the user, while the full destination information may assist the server in tracking the appropriate amount of payment to the customer who purchased the serving.

For the purposes of the present invention, the term “amount of payment” refers to transfer of money during the point-of-sale transaction where the user purchases a serving. The payment may be adjusted by the quantity and number of servings desired. Payment includes cash transfers, smart card charges and credit or debit
30 charges. The amount of payment is linked on the destination information so that a server may provide the correct bill to the user who consumed the serving.

For the purposes of the present invention, the term “container” refers to any vessel that may hold a serving to be dispensed. The container may have any type of construction such as a solid, wire, frame, net, *etc.* construction. The dispensing information or identification information may be printed directly onto the container, 5 as well as attached, affixed, joined, or fastened to part of the container. Examples of containers include the following cups, mugs, glasses, jugs, buckets, baskets, shells, pockets, sleeves, boxes, bins, tanks, *etc.*

For the purposes of the present invention, the term “bar code” refers to any 10 conventional bar code in a one-dimensional or two-dimensional form, readable by a scanner. A bar code may store, contain, hold, represent, *etc.* the identification information or dispensing information. A bar code may be read by a scanner that may be mounted on the dispensing apparatus or register, or is hand held. Preferably, the 15 bar code consists of black vertical bars and white spaces. A smart card that has a bar code may also be used to store, contain, hold, represent, *etc.* the identification information or dispensing information.

For the purposes of the present invention, the term “magnetic strip” refers to a 20 conventional magnetic strip card, such as a piece of paper, cardboard, plastic, *etc.*, that is magnetically encoded or encrypted. A magnetic strip may store, contain, hold, represent, *etc.* the identification information or dispensing information. A magnetic strip may be read by a scanner that may be mounted on the dispensing apparatus or register, or is hand held.

25 For the purposes of the present invention, the term “password” refers to security sequence consisting of alpha, alphanumeric or numeric code, that allows or permits a user to access, activated, enter, *etc.* the dispensing apparatus or related computer system. A password may be spoken, written, entered, scanned, punched, dialed, *etc.* to the corresponding system. A password may be a key word, code 30 phrase, code sequence, *etc.* and typically is secret. A preferred password is a PIN or a personal identification number. Typically, a PIN will consist of at least four digits, consisting of whole integers from 0-9. The digits may also consist of an alpha or alphanumeric code. A PIN may be altered by the appropriate individual through entered a new or replacement PIN. A PIN may be entered in a keypad, keyboard,

stylus pad or touch screen. A PIN may also be encoded on a magnetic strip or bar code that is scanned or read.

For the purposes of the present invention, the term "warehouse database" 5 refers to a computer system with memory and/or storage medium that stores and tracks servings dispensed by a dispensing apparatus for inventorying, billing, tracking, recording, reporting, *etc.* purposes. A warehouse database may be located off-site and communicated with by means of remote data transmission. A warehouse database is normally accessed by the business or owner that owns and operates a dispensing 10 apparatus or by the business that sells the servings to be dispensed. A warehouse database may be the same database as the storage medium. A warehouse database may be accessed to link dispensing information with destination information. A warehouse database may be the same database as the storage medium. A warehouse database may also include data received from the dispensing system, dispensing 15 container, cash register or POS.

For the purposes of the present invention, the term "refill serving" refers to an additional serving that is dispensed after the first serving that is authorized, *i.e.* for pay serving, and linked to the same destination information. A refill serving may be for a 20 set number of refills, six refill servings, or for an unlimited numbers of refills, *e.g.* a bottomless pot of coffee. A refill serving may be controlled by the time period within which the refills are to be dispensed. This time period may be controlled by the business or owners of the dispensing apparatus and preferably, the time period may expire at the close of business. A refill serving may be entered as dispensing 25 information before or after the first serving is dispensed. A dispensing system may refer to a refill serving as a "REFILL" serving, "REFILL NOT FOR PAY" serving, or "REFILL FOR PAY."

For the purposes of the present invention, the term "activation device" refers 30 to any device that may be used to activate one or more parts of a dispensing apparatus or dispensing system, and includes devices such as push buttons, switches, triggers, membranes, *etc.* A preferred activation device is a button, which is typically located near a light. Pressing a button will cause a series of predetermined events to trigger once the button is switched, activated or turned on. The series of events may be

mechanical, *e.g.* opening a valve, or electrical, *e.g.* performing a series of logical steps by through an automated process. An activation device may be any shape, size, color, and may either be a manual switch or an electronically activated button.

5 For the purposes of the present invention, the term “allocated time period” refers to a pre-determined timer that is started once a command is initiated and is not completed within the period of time. An allocated time period may be adjusted from serving to serving or from one use to a second use. For example, a timer may be used to return the system to the reset or restart step when no activity has occur after an
10 allocated time period, *e.g.* a button is not pressed after putting the dispensing apparatus in an activated state. In addition, the timer may be used to dispense a quantity of a particular sized serving dispensed, *e.g.* opening a valve for an allocated time period of seven seconds may dispense a twenty-ounce serving. Also, an allocated time period may determine how long refills are available, within the grace
15 timer, to a particular customer.

For the purposes of the present invention, the term “bill” refers to total amount of payment for the servings that are dispensed. Preferably, the bill may be a printed receipt that shows the servings purchased, the destination the number of servings and
20 quantity of the servings. The bill may also show the users, waiter and server, the time, business name and acceptable forms of payment, *etc.* associated with the bill. A “split bill” is a bill that is divided in the appropriate portion between two or more customers or methods of payment. For example, a split bill may occur at a large gathering where each person pays his/her share of the bill. Additional, a split bill may
25 occur when a customer desires to pay one part of the bill with one method of payment, *e.g.* cash and another part of the bill with another method of payment, *e.g.* credit card.

For the purposes of the present invention, the term “dispensing system” refers to one or more dispensing apparatus and any associated hardware or software that
30 includes: valves, keypads, touch screens, keyboards, stylus pads, spigots, handles, cash register system, storage medium, printers, screens, scanners, readers, computer, host system, computer control system, warehouse database, *etc.* A dispensing system may also include human interactions, such as the server delivering the serving and collecting the bill.

For the purposes of the present invention, the term “waiter” refers to a user that has authorization to access a cash register or POS system. The waiter opens and creates the bill for a customer by entering the destination, *i.e.* the location which may 5 include the table number. The waiter may be an employee, manager or supervisor. In some circumstances the waiter may be referred to both the user and server.

For the purposes of the present invention, the term “server” refers to a user that dispenses and may also deliver a serving to a customer. The server enters 10 identification information, dispensing information and destination information. The destination information the server enters preferably is the same destination information entered by the waiter. The server may be a waiter, waitress, table runner, bus person or secondary waiter or waitress. In some circumstances the server may be referred to both the user and waiter.

15 For the purposes of the present invention, the term “dispensing container” refers to a free-standing dispensing apparatus. A dispensing container may be a coffee urn, a thermos, a jug or a coffee pot. Preferably, a dispensing container may have a means for communicating with a host system, such as a computer and a means 20 for entering data and a means for controlling the spigot or latch needed to open a pour spout. A preferred means for communicating may be via a conventional wireless link.

25 For the purposes of the present invention, the term “customer” refers to an individual to whom a serving is delivered by a server, waiter, *etc.* A customer may communicate to the waiter, server and/or user the desired serving. A customer may also satisfy the amount of payment on the bill. A customer, in a self-serve arrangement, may be the user of the dispensing system of the present invention.

30 For the purposes of the present invention, the term “owner” refers to the entity that owns a dispensing system or dispensing apparatus. An owner may be an individual who owns the business where the dispensing system is located and the dispensing system. Alternatively, an owner may be the individual who owns the dispensing system, when another entity owns the location where the dispensing is located. Ownership may be split or shared between several individuals and entities.

Preferably, the owner refers to the individual or entity that has authorization to control the dispensing system.

For purposes of the present invention, the term “dispensing activity report” 5 refers to a spreadsheet or database that contain information to serving that is dispensed from a dispensing system and/or the cash register. The dispensing activity report may be generated by a bill, which is opened by a user – preferably a waiter, which is based on a dispensing activity, *i.e.* a serving that is dispensed. The serving that is dispensed may have related information of identification information, 10 dispensing information, destination information, communication information, *etc.* The information contained within the dispensing activity report may be configurable by the owner or user and may alter accordingly. Preferably, a dispensing activity report is generated by a computing or automated method and display on a screen. The information contained with the dispensing activity report may be printed via a suitable 15 means to an appropriated material. While a dispensing activity report is described as a spreadsheet or database, any similar computing method to create reports may be used.

For purposes of the present invention, the term “connection” refers to a means 20 to link two or more devices. A connection may be a wired or wireless connection. Preferably, a connection is the link between one device that sends information and another device that receives the same information. For example, an information entry device may be connected via a wireless link to a host system within a dispensing system that receives and processes the information.

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For purposes of the present invention, the term “cash register” refers to any conventional cash register system and may include a magnetic reader or scanner. A cash register preferably is the customer interface when the server or waiter takes the order and enters the order at a cash register. A cash register may be part of a POS 30 system and dispensing system. A preferred use for the cash register is to store, collect and process payments made by customers. A cash register may also be used for data entry, product lookup and other computer related tasks.

For purposes of the present invention, the term “POS” refers to point of sale system. A POS generally refers to a system that made up of computer hardware and software equipment. Preferably, a POS usually includes two or more computers or dispensing systems networked together to share data and resources. One of the 5 computers may be a cash register. Another computer may be a warehouse database or storage medium. A business may have a single computer that serves both the cash register and storage functions.

For purposes of the present invention, the term “touch sensor” refers to any 10 conventional touch sensor device, such as a touch sensor device that may be activated by pressure, force, motion, weight, vibration, *etc*. A touch sensor may be located on a table in a place of business. Prior to a user, such as server or waiter, dispensing a serving for table, the user would touch the dispensing container to the touch sensor on the table. Destination information may be sent via a connection to communicate with 15 the dispensing system that the particular dispensing container is serving a particular location or table. Placing a dispensing container on a touch sensor may also transmit other information, such as identification information, dispensing information and communication information. A dispensing container may be placed on top of a touch sensor or next to a touch sensor. A light indicator may be used on the touch sensor or 20 dispensing container to indicate a successful communication of the desired information.

Description

25 FIG. 1 is a flow chart that illustrates a preferred embodiment of the method of the present invention for controlling the operation of a dispensing apparatus. All steps not indicated as performed by a user are performed by a control system, such as a computer system, controlling the operation of the dispensing apparatus. In step 100, a user enters identification information. In step 102, the identification information entered in step 100 is verified and the entry of valid identification information will 30 place a dispensing apparatus 104 in a ready state, in step 106. If, in step 102, the identification information entered in step 100 is not valid identification information, the system will reset, and a user may re-enter identification in step 100. An owner of a dispensing system or an authorized individual may limit the number of re-enters a

user may attempt by setting a limit. In step 108, a user enters dispensing information 110 and destination information 112, which are stored in a storage medium 114.

In step 106, a user places dispensing apparatus 104 in a ready state that allows dispensing apparatus 104 to run linking step 116 which links dispensing information 110 to destination information 112. In linking step 116, dispensing information 110 is linked to destination information 112 based on the appropriate matching, reconciling, *etc.* processes. In linking step 116, once the appropriate information has been linked, then the information is processed in step 117. If, in step 117, there is a successful link, then dispensing apparatus 104 may be placed in an activated state, in step 118. In step 117, if there is a problem linking dispensing information 110 to destination information 112, an error 120 is reported and the dispensing apparatus 104 is placed in a stand-by state, in step 122.

In step 118, when dispensing apparatus 104 in an activated state the user, in step 124, may activate an activation device, such as a push-button, to start step 126, which starts a timer valve. The timer valve controls the dispensing of the serving based on opening the timer valve for a duration of time in correspondence to a known allocated time period. An allocated time period starts in conjunction with the timer valve as the timer valves begins to dispense the servings and ends when the serving quantity is satisfied. In step 128, if the serving is not dispensed, dispensing apparatus 104 returns to step 124 and resets. In step 128, once the serving is dispensed by dispensing apparatus 104, dispensing apparatus 104 is placed in a stand-by state, in step 122. Also, in step 128, regardless of whether the serving is dispensed, entries are made into the warehouse database, as shown in step 130. Other errors that occur during the process, such as those in step 120, are reported and recorded in the warehouse database. In step 124, if the activation device is not activated within an allocated time period, the dispensing apparatus, in step 132, will time out and return to ready state, in step 106.

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FIG. 2 is a flow chart that illustrates a preferred embodiment of the method of the present invention for controlling the operation of a dispensing apparatus that is used to dispense refill servings. All steps not indicated as performed by a user are performed by a control system, such as a computer system, controlling the operation

of the dispensing apparatus. In step 200, a user enters identification information. In step 202, the identification information entered in step 200 is verified and the entry of valid identification information will place a dispensing apparatus 204 in a ready state, in step 206. If, in step 202, the identification information entered in step 200 is not valid identification information, the system will reset, and a user may re-enter identification information, in step 200. An owner of a dispensing system or an authorized individual may limit the number of re-enters a user may attempt by setting a limit. In step 208, a user enters dispensing information 210, including refill serving information 211 and destination information 212, which are stored in storage medium 214. Refill serving information 211 includes whether or not a refill serving may be later dispensed to the destination linked to a particular serving.

In step 206, a user places dispensing apparatus 204 in a ready state that allows dispensing apparatus 204 to run linking step 216 which links dispensing information 210 to destination information 212. In linking step 216, dispensing information 210 is linked to destination information 212 based on the appropriate matching, reconciling, *etc.* processes. In linking step 216, once the appropriate information has been linked, then the information is processed in step 217. If, in step 217, there is a successful link, then the dispensing apparatus 204 is placed in an activated state, in step 218. In step 217, if there is a problem linking dispensing information 210 to destination information 212, an error 220 is reported and dispensing apparatus 204 is placed in a stand-by state, in step 222.

In step 218, when dispensing apparatus 204 in an activated state the user, in step 224, may activate an activation device, such as a push-button, to start step 226, which starts a timer valve. The timer valve controls the dispensing of the serving based on opening the timer valve for a duration of time in correspondence to a known allocated time period. An allocated time period starts in conjunction with the timer valve as the timer valves begins to dispense the servings and ends when the serving quantity is satisfied. In step 228, if the serving is not dispensed, dispensing apparatus 204 returns to step 224 and resets. In step 228, once the initial serving is dispensed by dispensing apparatus 204, dispensing apparatus 204 is placed in a stand-by state, in step 222. Also, in step 228, regardless of whether the initial serving is dispensed, entries are made into the warehouse database, as shown in step 230. Other errors that

occur during the process, such as those in step 220, may be reported and recorded in the warehouse database. In step 224, if the activation device is not activated within the allocated time period, the dispensing apparatus, in step 232, will time out and return to ready state, in step 206.

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In step 222, dispensing apparatus 204 in a stand-by state may be restarted by a user repeating step 200 and entering identification information to dispense a second or subsequent refill serving. If, in step 202, the identification information the user entered in step 200 is verified to be valid and the refill serving 211 linked to the identification information is confirmed, dispensing apparatus 204 is placed in a ready state, in step 206. Step 208 is skipped for a refill, because dispensing information and destination information was entered to dispense a first serving, as described above. Dispensing of the refill serving then proceeds as described above for the first serving.

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The refill serving information entered in step 208 will allow a user to dispense a serving until the time on the refill serving expires or until the number of refills allocated is exceeded. Typically, this time on the refill serving will expire at the close of the business day.

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FIG. 3 is a flow chart illustrating yet another preferred embodiment of the method of the present invention for use with dispensing a beverage, such as coffee, using a magnetic card reader. All steps not indicated as performed by a user are

20 performed by a control system, such as a computer system, controlling the operation of the dispensing apparatus. In step 300, the system is initiated when a user enters a sales exchange with the business or owners of the dispensing apparatus to purchase a

25 serving at a register. In step 302 a user swipes a magnetic stripe card against a conventional magnetic card reader. In step 304, the user enters a PIN on an entry device 306, such as a touch screen, keyboard, stylus pad, or keypad. The PIN is validated in step 308. If the PIN is rejected in step 308, the entry device prompts the

30 user to re-enter the PIN at step 304. If the PIN is accepted in step 308, the dispensing apparatus is put in a readied state, and the register prompts the user to enter the dispensing information consisting of location, in step 310, number of servings, in step 312, and dispensing apparatus, in step 314 into entry device 306. Additional dispensing information may be added as desired by the business or owners of the

dispensing apparatus. The user is prompted to confirm the correct data, in step 316. In step 316, a determination is made as to whether the necessary dispensing information is properly entered. When the necessary dispensing information is properly entered, in step 316 a light on the dispensing apparatus is turned on, as shown in step 318. When the necessary dispensing information is missing or incorrect, in step 320, the entry device will request the user to re-enter the dispensing information as shown by arrow 322.

In step 318, once the dispensing apparatus light is turned on, the user, in step 10 324, presses a button that corresponds to a desired valve. In step 324, once the button is pressed the valve will be enabled, as shown in step 326. In step 326, the enabled valve will start step 328, the increment pour timer, which will start dispensing the serving into a container. In step 328, the serving quantity is measured by the length of time the increment pour timer is set to pour. In step 330, the number of servings 15 dispensed is counted and if there is remaining number left to be dispensing the dispensing apparatus will keep the light on, in step 318. Once in step 318 for a second time the user may press the button, in step 324, to dispense a second serving. In step 324, when the activation device is pressed a second time, step 328 will start the increment pour timer and the quantity of serving will be dispensed into a container 20 according to the allocated time period the increment pour timer is set to dispense. In step 330, once the number of servings dispensed is satisfied the valve in step 332 will be disabled. The disabled valve will, in step 334, turn the light off and the system is ready to begin again at step 300.

25 In step 318, once the dispensing apparatus light is turned on, the user will need to press a button, in step 324, that corresponds to a desired valve. An allocated time period begins once the light is turned on. If, in step 324, the activation device is not pressed within an allocated time period, in step 336, the increment timeout timer will start. The increment timeout timer resets the dispensing apparatus when the 30 dispensing apparatus has been idle for an allocated time period. In step 338, when the increment timeout reaches out, by having an allocated time period reach end, then in step 340, the timeout timer will be cleared. In step 342, the valve will be disabled and in step 334 the light will be off and the process may start again at step 300. In step 338, when the increment timeout timer does not reach out, the timer and allocated

time period will be reset and return operation of the dispensing apparatus to step 336.

FIG. 4 is a flow chart illustrating how a user may enter dispensing information in a preferred embodiment of the method of the present invention. All steps not indicated as performed by a user are performed by a control system, such as a computer system, controlling the operation of the dispensing apparatus. In step 400, the transaction is begun. In step 402, the user is shown a starting screen on a entry device or touch screen. In step 404, the user scans a card having magnetic strip, which may be on a credit or debit card, driver's license, *etc.* If, in step 404, the magnetic strip is not scanned within the allocated time period or is canceled, then in step 406 the entry device redisplays the starting screen of step 402 and the user starts over in step 402. If, in step 404, the magnetic strip is accepted, and not canceled nor timed out, then in step 406 the dispensing apparatus is put in a readied state and the dispensing information may be entered by the user.

In step 408, the user is prompted by the entry device to enter the destination information. The length of the allocated time period set for each step controls the time out function of the dispensing system. Each step, as indicated, may have an allocated time period to perform the function, *i.e.* entering information. If, in step 408, the destination information is not entered within the allocated time period or is canceled, in step 410, the entry device redisplays the starting screen of step 402 and the user starts over at step 402. Alternatively, if in step 408, the process is canceled and the dispensing apparatus is returned to the readied state of step 406. If the user cancels the process in step 406, the entry device redisplays the starting screen of step 402 and the user starts over at step 402. In step 412, the system prompts the users to enter the number of servings. If, in step 412, the number of servings is not entered within the allocated time period or is canceled, in step 414, the entry device redisplays the starting screen of step 402 and the user starts over at step 402. Alternatively, if in step 412, the process is canceled the user is returned to step 410. If the user cancels the process in step 410, the entry device redisplays the starting screen of step 402. In step 416, the entry device prompts the user to enter the amount of payment. If, in step 416, the amount of payment is not entered within an allocated time period or is canceled, in step 418, the entry device redisplays the starting screen of step 402 and the user starts over at step 402. Alternatively, if in step 416, the process is canceled

the user is returned to step 414. If the user cancels the process in step 414, the system is reset to step 402. In step 420, system prompts the users to enter the dispensing apparatus location. If, in step 420, the dispensing apparatus location is not entered within the allocated time period, the entry device redisplays the starting screen of step 5 402 and the user starts over at step 402. Alternatively, if in step 420, the process is canceled the user is returned to step 418. If the user cancels the process in step 418, the entry device redisplays the starting screen of step 402 and the user starts over at step 402. . A similar process may be used to enter other dispensing information such as type of serving, refill servings, *etc.*

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In step 422, once all the dispensing information is entered, the system spawns the dispensing apparatus, *i.e.* places the dispensing apparatus in an activated state. In step 424, the dispensing apparatus is in an activate state ready to dispense the serving as entered above in the dispensing and destination information. Also, in step 422, the 15 process of entering dispensing information is reset by step 426 and is ready for the next transaction to start at step 400.

FIG. 5 is a flow chart illustrating how a dispensing apparatus of the present invention operates in a preferred embodiment of the method of the present invention. 20 All steps not indicated as performed by a user are performed by a control system, such as a computer system, controlling the operation of the dispensing apparatus. In step 500, the dispensing apparatus is put in an activated stated based on the identification information and dispensing information. When the dispensing apparatus is in an activated state, a valve on a dispensing apparatus, in step 502, may be activated by a 25 user. Although, the preferable embodiment of the present invention is for the dispensing apparatus to be activated by a user in an activated state, the valve within the dispensing apparatus may also be activated separately by a user when the dispensing apparatus uses a valve. In step 504, the corresponding light indicator for the valve on dispensing apparatus is turned on. In step 506, an allocated time period for the timeout timer is reset and the period for performing dispensing starts. In step 30 508, an allocated time period for the increment pour timer is reset. The length of the allocated time period controls the quantity of serving the increment pour timer will dispense. In step 510, an activation device, such as a push button, may be pressed or activated. If, in step 510, a push button is pressed or activated, the timeout timer,

which was set in step 506, is reset, in step 512. In step 514, the increment pour timer begins the process of dispensing the serving, by dispensing the serving in relation to a known duration that was set by the allocated time period. In step 516, once the serving is dispensed, the valve on the dispensing apparatus is disabled, in step 518. In 5 step 520, a light indicator is shut off and the system is reset, in step 522. In step 524, a valve on a dispensing system is stopped and a dispensing apparatus is returned to a stand-by state.

10 In order to prevent a dispensing apparatus from being placed in an activated state indefinitely, a timeout procedure is used. If in step 510, the user does not press the button to activate the dispensing apparatus, the increment timeout timer is started, in step 526. The increment timeout timer will run for the duration equal to the allocated time period, which has been adjusted to a certain duration. In step 528, once the increment timeout timer reaches the of the time in the allocated time period, the 15 valve on the dispensing apparatus is disabled, in step 518. In step 520, a light indicator is shut off and the system is reset, in step 522. In step 524, a valve on a dispensing process is stopped and a dispensing apparatus returns to a stand-by state.

20 FIG. 6 is a flow chart illustrates how Point of Sale (POS) matching between dispensing information and identification information may be conducted by a control system, such as a computer system, in a preferred embodiment of the method of the present invention. In step 600, the POS matching begins by basing the dispensing information on the identification information. In step 602, the control system first 25 reconciles the data to determine if the matched data is a new transaction, *i.e.* a POS that has not previously initiated the dispensing apparatus to dispense a serving. In step 604, when the new transaction is determined an allocated time space begins a grace period unique to the transaction. The grace period may be the period of time that the dispensing apparatus is authorized to dispense refill servings. In step 606, the common factor between the dispensing information and identification information, 30 namely the destination information, is linked and checked. In step 606, if the destination information does have a bill or check started for that destination information, then a charge is placed on the bill as a unmatched serving charge, in step 608. In step 608, the unmatched serving charge 608 is placed on the check or bill and the appropriate payment amount is linked to the transaction, in step 610. In step 612,

the allocated time space is reset. In step 614 the POS matching or linking process ends. When the matching ends, in step 614, the data created may be entered on the dispensing information or in the warehouse database.

5 In step 602, when there is no new transaction, then the dispensing apparatus checks for any new POS transactions, in step 616. If there are no new POS transactions, in step 616, then dispensing apparatus resets back to a beginning step 600. In step 616, when a new POS transaction is found the dispensing apparatus checks for a transaction for the same common factor, in step 618, *i.e.* destination
10 information. In step 618, when there is a transaction for the same common factor, the dispensing apparatus proceeds with step 608, placing the unmatched serving charge on the check or bill. In step 610, the transaction is matched. In step 612, the allocated time period for the timeout function of the dispensing system is reset. In step 612 the POS matching or linking process ends. When the matching ends, in step 612, the data
15 created may be entered on the dispensing information, dispensing activity report, or in the warehouse database. If, in step 618, there is no transaction for the same common factor the dispensing apparatus resets back to a beginning step 600.

20 In step 608, when checking for an unmatched serving charge on the bill and a match is found, the dispensing apparatus, in step 620, checks the dispensing information as to whether this match is the first serving that appears on the check or bill. In step 620, when dispensing information is the first serving appearing on the check or bill, the dispensing apparatus, in step 622, sets this bill as an alert condition to flag as an unpaid serving. An alert condition would indicate to the user, server or
25 waiter that the potential for an error or fraud exists on a bill, unless the uncharged serving may be accounted for on the bill. In step 620, when this is not the first serving appearing on the check, the grace period timer, in step 624, is checked. The grace period timer is set by a known duration of allocate time period as desired by the owner for when refills are allowed. In step 624, if the grace period timer does reach
30 time out then the next serving is flagged as a refill, in step 626. In step 612, the allocated time space is reset for the grace period timer and the matching process ends, in step 614. In step 614, the data created may be entered on the dispensing information or in the warehouse database.

In step 624, if the grace period timer does not reach time out then the increment grace period timeout timer, in step 628, starts. The increment grace period timeout timer will run based on a length determined in an allocated time period. In step 622, the dispensing apparatus sets this bill as an alert condition to flag as an
5 unpaid serving. An alert condition may be printed on a receipt so that the server may notify the business of the unpaid serving or collect the appropriate money from the customer to resolve the alert condition. An alert condition, when flagged, may prevent further servings from being dispensed and linked to a particular bill based on the destination information.

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A preferred method of matching is described in co-pending application 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, which is a divisional of 60/169,198 entitled "Service Transaction Monitoring System, Method and Device" filed on December 10, 1999,
15 the entire contents and disclosure of which are hereby incorporated by reference.

FIGS. 7A, 7B and 7C, show an information entry device 700 as constructed in accordance with an embodiment of the present invention. A user, preferably, the server, may enter identification information, dispensing information or destination information by entering the information on a touch screen 702. Alternatively, a user may enter identification information, dispensing information or destination information by swiping a magnetic card through a reader 704. Once the dispensing system is ready to dispense the serving, a user may place a container under a spigot 706. The serving travels through a valve 708 from the dispensing apparatus (not shown). Entry device 700 may be attached to the dispensing apparatus by a mounting collar 710.

The identification information, dispensing information, communication information or destination information that is entered may be transmitted via conventional wireless technology using antennae 712 to a host system (not shown). In an alternative embodiment of the an information entry device of the present invention, the identification information, dispensing information, communication information or destination information may be transmitted via a conventional wired connection to the dispensing system or receiving computer system instead of using the
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wireless embodiment shown in FIGS. 7A, 7B and 7C.

FIG. 8 is a perspective cut-away view of a valve system as part of the dispensing system constructed in accordance with an embodiment of the present invention. A pull type solenoid 800 may retract lifting a solenoid plunger 802. Solenoid plunger 802 pulls up on a valve spring 804, which may allow a serving to fill a container through a spigot 806. The serving may travel from the dispensing apparatus (not shown) through valve 808 out through spigot 806. Solenoid plunger 802 also lifts up a valve stopper 810 and a valve plunger 812, when solenoid plunger 802 lifts up on valve spring 804.

The valve stopper 810 of the present invention may be constructed from rubber or a similar material.

FIG. 9 is a rear perspective view of an entry device 900 attached to a valve system 902 constructed in accordance with an embodiment of the present invention. The user may swipe a magnetic card through a reader 904 to activate the dispensing system. The serving may fill a container through a spigot 906. The serving moves through a valve 908 out through spigot 906. Entry device 900 is attached to the dispensing system by a mounting collar 910. The information entered by the user may be sent via a wireless link using antennae 912 or via a wired connection (not shown).

FIG. 10 is a perspective view of a dispensing apparatus control device 1000 of the present invention attached to a valve on a dispensing apparatus 1002 constructed in accordance with an embodiment of the present invention.

In a preferred embodiment of the present invention, the control of the dispensing apparatus begins from an off or neutral state, prior to any information, identification dispensing, or destination, being entered, and preferably is when the dispensing apparatus is shut off. Even when the activation device, such as a switch or push button, for the dispensing apparatus is turned on, the dispensing apparatus remains in the off or neutral state until some action by a user. If the dispensing apparatus is an electrical powered dispensing apparatus the off state is when the

electrical powered dispensing apparatus is receiving no electrical power. In a neutral state where the electrical powered dispensing apparatus is receiving a low supply of power to keep the dispensing apparatus power on, but not perform any function.

5 The dispensing apparatus may move from an off state or neutral state to a readied state when a user enters valid identification information. Although the dispensing apparatus may not dispense a serving when in the readied state, the dispensing apparatus in a readied state starts a process to link the dispensing information to destination information. A linking process may involve using another
10 factor, such as identification information, to perform a second link. A control system, such as a computer system, may perform the linking step in a readied state. A preferred method of linking is described in co-pending application 09/733,719 entitled “Service Transaction Monitoring System, Method and Device” filed on December 8, 2000, which is a divisional of 60/169,198 entitled “Service Transaction Monitoring
15 System, Method and Device” filed on December 10, 1999, the entire contents and disclosure of which are hereby incorporated by reference.

Once the dispensing information and destination information are entered and dispensing apparatus in a readied state makes a successful link, the dispensing
20 apparatus is placed in an activated state. The activated state permits the dispensing apparatus to dispense a serving, provided the user acts upon the dispensing apparatus. Typically, a user will activate the dispensing apparatus by activating an activation device, such as by pressing a push button located near a light indicator, to dispense the serving. A dispensing apparatus may have an activation device, with no indicator,
25 e.g. a one valve coffee pot or dispensing container. The user may enter additional dispensing information during the activated state to further track the serving for inventory purposes or to create the dispensing activity report.

Once a serving is dispensed, the dispensing apparatus may be placed in a stand-by state. In a stand-by state the dispensing apparatus is not establishing a link or match between the dispensing information and destination. Also, in a stand-by state the dispensing apparatus is not dispensing a serving. The dispensing apparatus in a stand-by state is waiting for the identification information to be entered or re-entered. The ability to put a dispensing apparatus in a stand-by state is particularly
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useful for dispensing refill servings.

Although the steps of the present invention are shown as being performed in a particular order or sequence in the embodiments described above, the steps of the present invention may be performed in a variety of orders or sequences. The order or sequence of a dispensing system may vary for owner to owner and may be in any order or a different sequence. For example, the functions may be performed in a different sequence as follows: accept a valid user, turn on, enter a serving, dispense a serving, wait for a next serving or shut down. Alternatively, the sequence may be as follows: turn on, enter a serving, accept a valid user, dispense a serving, wait for a next serving or shut down. In addition, when steps are preauthorized, such as accepting a valid user or set predetermined dispensing information for a particular dispensing container, then those steps may be left out.

Although the present invention describes automatically placing or returning a dispensing apparatus to a particular state, *i.e.* activated, stand-by, readied, *etc.*, the method for doing so is not limited to an automated method. The placing of a dispensing apparatus or dispensing system into a particular state may involve a command for the dispensing apparatus to perform a logical condition, such as POS matching, linking and reconciling of dispensing information to destination information. Alternatively, the dispensing apparatus might have an activation device that the user activates to move the dispensing apparatus from one state to another.

One or more various light indicators representing which state the dispensing apparatus is currently in may be used in the dispensing system of the present invention. Light indicators may be used in conjunction with other indicators located on the dispensing system or dispensing apparatus. One or more various light indicators may be on an electronic device, such a pager, to inform the server of the dispensing apparatus current state when the employee is not near the dispensing apparatus. The electronic device may communicate via a connection, *i.e.* a wireless link, with a host station that is connected to the dispensing apparatus or part of the dispensing system. The light indicator may also be located in a control station, such as the cash register, maître d's station or bartender's station, to allow a second employee to monitor the dispensing of servings. One or more various light indicators may also

be present in a management station so that management or owner may monitor the servers as the servers dispense servings. Light indicators may be in any shape, size, color, intensity, *etc.*

5 The activity of each state may be recorded as part of the entries recorded in the warehouse database for later review, such as monitoring or tracking. The duration an electric powered dispensing apparatus is in one particular state may be useful when reviewing electric bills. The electric powered activity may also be part of the dispensing activity report.

10 A user may enter the identification information in a variety of methods. One method is for the user to scan a bar code or card with a magnetic strip. Another method is for the user to enter a password or PIN using a keypad, keyboard, stylus pad or touch screen. Another method is for the user to use a smart card. In addition, 15 the user may use a cell phone, lab top, or personal digital assistance (PDA), that contains the identification information, to communicate with a host system that is connected to the register or dispensing apparatus via a wireless communication link.

20 Preferably the user identification information of the present invention contains enough information for the business, owners or operators of the dispensing apparatus to identify the user with reasonable particularity. The types information contained or stored within the identification information may consist of the user's name, address, company identification number, Social Security number, phone number, *etc.* The 25 owners or operators of a dispensing apparatus may find it appropriate to have one company-specific piece of information contained or stored on each user's identification information as to track or monitor the authorized users. There also may be different identification information, depending on the owner's needs, for waiters as compared to servers.

30 The user of the method of the present invention may be a customer of a business or an employee of a business who serves a customer, such as a waiter or server. A user preferably enters the dispensing information after the identification information was accepted and confirmed. A user may enter the dispensing information using a variety of methods. One method is for the user to enter, by typing

on a keypad, the dispensing information into a computer, information entry device or register. Another method is for the user to enter, by using a touch screen, stylus pad or stylus tablet entry device, the dispensing information into a computer or cash register. Alternatively, another method is for the user to enter, by using a wireless communication device, such as a cell phone, lab top or personal data assistant (PDA), the dispensing information into a computer or other entry device. Dispensing information may also be determined automatically by the time a timer valve, or similar device, on the dispensing container or dispensing system takes to dispensing a single serving. The time may be set by the allocated time period. An automatic determination of dispensing information is preferable in a high volume business.

The dispensing information may consist of various pieces of information that the dispensing apparatus may need to dispense a desired serving. The dispensing information may consist of a quantity, number, location, amount of payment, marked or flagged as a refill serving, type of serving, and which dispensing apparatus will dispense the serving. The dispensing information consisting of which dispensing apparatus will dispense the serving may be important when a serving is to be dispensed from an array of dispensing apparatuses or from a multi-dispensing apparatus. Additional dispensing information such as time, user settings, servings additives, server identification, *etc.* may be used as dispensing information as required by the owners or operators of the dispensing apparatus. Some pieces of dispensing information may be automatically entered, such as time or quantity.

The dispensing information may depend on the needs of the business, owners or operators of the dispensing apparatus and will vary from one business, owners or operators to another. Although, default settings with dispensing information consists of various pieces of information may be acceptable to some businesses, owners or operators of dispensing systems, those default settings may be altered as needed.

The dispensing information may also be predetermined. The predetermined dispensing information would involve the user pressing or entering a single key, button, or membrane, *etc.* corresponding to a desired serving. A user may also enter the predetermined dispensing information through a wireless link using a cell phone, lab top, or PDA. The pieces of the dispensing information, quantity, number,

location, type of serving, marked or flagged as a refill serving, amount of payment, *etc.* are automatically entered as the dispensing information. The predetermined dispensing information is particularly useful for high volume operators of dispensing apparatus, such as fast food restaurants. The predetermined dispensing information is 5 also well suited for gift certificates, game pieces or similar promotional materials. In additional, the predetermined dispensing information may be programmed into a cell phone, lab top or PDA which may remotely communicate with a host system that is connect to the cash register, touch screen, keypad, stylus pad, keyboard or dispensing apparatus via a wireless link.

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Once the dispensing information is completed and confirmed, the dispensing information may create the destination information, if not already created as a piece of the dispensing information. A preferable method for creating the destination information is to use the location as entered as part of the dispensing information.

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Using a location entry in two places, *i.e.* one location entry in destination information and the same location entry in dispensing information, may be important and particularly useful for the linking process to link a bill with a serving dispensed. In some businesses, the location for every user may be the same and another common factor, such as identification information, may be used to operate in the same capacity 20 as location in the destination information. Alternatively, the destination information for dispensing container may be determined automatically by a triangulation method using remote sensors. A user, such as a waiter, may use a touch pad located on a table to communicate the destination information of the dispensing container to the dispensing system.

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The dispensing information and destination information may be stored on the storage medium. The storage medium may be located near the dispensing apparatus to provide a direct connection from the storage medium to the dispensing apparatus. The storage medium may also be part of a network of computers that is access over a 30 network by the dispensing apparatus or dispensing system. The dispensing apparatus, dispensing system or software program may access the storage medium during the linking, matching, POS matching, or reconciling step. A preferred method of a matching is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on

December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference. The warehouse database may also access the storage medium when create reports and making entries to track servings.

5 The dispensing information may also be stored in other methods. The dispensing information may be stored on a medium, such as a bar code, magnetic strip card, *etc.* Also, the dispensing information may be contained with a smart card. Alternatively, the dispensing information may be programmed into a cell phone, lab top, or PDA that may communicate with the dispensing apparatus via a wireless link.

10 When the dispensing information is stored or contained as such, the linking, matching, reconciling step then bases the destination information in the storage medium with the destination information stored or contained on such alternative storage methods. The remote storing or containing of the destination information may be particularly useful in large settings with several dispensing apparatuses and multi-dispensing apparatuses, such as a ballpark or amusement park.

15 The dispensing apparatus may have a variety of physical characteristics and structure. One such structure is for a dispensing apparatus to consist of a bin, activation device, and valve. The servings are stored in the bin. The user accesses the serving by pressing an activation device, which triggers a valve to release the serving. The serving exits the bin through the valve into a container. The dispensing apparatus may be a part of a multi-dispensing apparatus. In addition, a dispensing container may be used in placed a dispensing apparatus, when appropriate. One example of a preferred dispensing apparatus is shown in FIG. 10.

20 The multi-dispensing apparatus consists of several dispensing apparatuses, preferably within the same physical structure. In the multi-dispensing apparatus, there may be several bins, activation devices, and valves, as well as additional separators and connectors. The serving exits the appropriate bin through the corresponding valve into a container. Individual dispensing apparatuses that may be combined into a multi-dispensing apparatus may be an ice cream machine that may swirl two or more ice cream flavors together. Also, the combination to create a multi-dispensing apparatus may be a soft drink station with several flavors of soft drinks.

In a preferred embodiment, the container into which a serving is dispensed may have coded information such as a bar code, magnetic strip, *etc.* placed on the container itself. The coded information may include the identification information, the dispensing information, the destination information or any combination of the identification information, dispensing information and destination information for one or more servings. The coded information may include information obtained from a customer that is then printed out on a label and adhered to the container. Alternatively, particular container may have particular coded information printed on the container. For example, particular containers may have coded information printed on the container to indicate the size of the serving to be dispensed or to allow for refill servings to be dispensed.

Once a serving is dispensed, the destination information may be used to link the serving to the user with the amount of payment. A preferred method of a linking is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference. For example, when a server dispenses a serving and delivers the serving to a customer, the server may track the payment of the serving. In a preferred embodiment of the present invention, the destination information may be used to produce an accurate bill or check to be collected from the customer or consumer of the serving. While the destination information is preferable based on the location, the destination information may also be based on the amount of the payment that is required to satisfy payment of a serving dispensed.

Once the dispensing apparatus is in a ready state, the user may activate an activation device to dispense a serving. The activation device corresponds to one dispensing apparatus. This is particular useful on a multi-dispensing apparatus, where a set of activation devices may directly correspond to a set of dispensing apparatus, respectively. A light indicator may assist the user to indicator which dispensing apparatus is in an activated state ready to dispense as soon as the activation device is pressed. A timer is reset, within the allocated time period, to provide sufficient time for the user to make a decision, but not so long as to keep the dispensing apparatus in an unnecessary prolonged activated state. Once the timer times out, the user may

need to repeat some or all of the previous steps to return to the same position. An auto-recovery system may be useful to return a user to same step without the user having to go through each step in duplicate.

5 Once the dispensing apparatus initiates the dispensing or pouring of the serving, another timer begins to measure the quantity of the serving. The timer operates within an allocated time period that corresponds to the quantity of the serving. This step may involve the dispensing apparatus or dispensing system looking up a chart of time-to-quantity to get the appropriate time. Looking up the time to
10 quantity is particularly useful when a dispensing apparatus dispenses a range of quantities. The dispensing apparatus is disabled after the serving is dispensed or poured or when the timer times out. The dispensing apparatus may return to the readied state, a stand-by state, or an off or neutral state. The properly dispensed serving may be flagged as such with an indicator that shows the user that no error
15 occurred during the process. If the indicator shows an error during the process, the dispensing apparatus will take the user back through the previously preformed steps to find the error. A successful dispensed serving will fit within the container without spilling over.

20 After the dispensing apparatus is taken out of an activated state, the activities of the dispensing apparatus are entered, stored, recorded as entries in a warehouse database. Preferably the identification, dispensing and destination information, as well as any errors will be reported, entered, or stored. The warehouse database is a large storage medium that may be located off-site from the dispensing apparatus.
25 Preferably the warehouse database is located in the office of the operator or owner of the dispensing apparatus. The operator or owner may need the entries to prepare reports, inventories, billing, accounting functions, and payments to employees. The warehouse database is capable of processes any to entries to create a ratio, chart, or raw number. In addition, several warehouse databases may be provided to the
30 accountant, distributor, owner, or manager, *etc.* that provides the same or tailored information to the particular user. The warehouse database may be used in creating the dispensing activity report.

Previous methods and systems for tracking inventories of servings tracked the

number of containers or cups that were used, as opposed to the quantity of servings dispensed. The previous methods in tracking the containers or cups could not accurately reflect the amount of refill servings or additional servings that were dispensed in a single container. The present invention several advantages over 5 previous methods because the inventory monitoring may be performed by tracking the quantity of servings dispensed. The present invention ensures a more accurate inventory and provides the owner or operator of the dispensing system or dispensing apparatus with detailed and useful information. The warehouse database may store and track this information. In addition, such information may be used or printed on a 10 dispensing activity report.

The present invention may dispense servings as a refill serving. The refill serving may be repeated a number of times within the allocated time period of the business's hours of operation. After one servings as been dispensed, a second refill 15 serving may be dispensed based on the same identification information. The dispensing information is altered from each serving to the next to reflect the refill serving is being dispensed. The alteration may require a user to enter dispensing information a second time. Preferably, the user indicates that the refill serving as a "REFILL NOT FOR PAY" or "REFILL FOR PAY." The alteration is entered and 20 stored as second dispensing information, including a refill serving. The reminder of the dispensing information will carry over from the previous dispensing information.

The method for dispensing a refill serving may be substantially similar to the method of dispensing a single serving. The readied dispensing apparatus links, 25 matches, reconciles, *etc.* the dispensing information, now contained the refill serving, based on the destination information. A successful link, match, reconcile, *etc.* will result in the dispensing apparatus being placed in an activated stated. A preferred method of a matching is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" 30 filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference. The user activates the activation device and the serving is dispensed into the container. The serving is flagged on the second dispensing information, destination information and warehouse database as a serving dispensed as a refill serving. The activated dispensing apparatus is placed in a stand-by state

and awaits the users to access the dispensing apparatus for a further serving. The process continues on until the business deems the refills to end. This period of time is usually until the close of business or ends when the customer leaves the business.

5 In an alternative embodiment, the present invention may be used when a guest or customer orders a serving, such as a coffee, and a server, such as bus boy, gets the drink from a dispenser and delivers the serving to the customer. Previous methods relate to payment methods and dispensing but not to the identification of the user who dispenses the serving and not to the destination information, as a common factor
10 between the bill and the dispensed serving. In an alternative embodiment of the method of the present invention may involve a procedure of matching a dispensed serving from a dispenser system that may be not directly connected to a cash register system, *i.e.* POS system user interface. The method may also involve a procedure of matching a dispensed serving from a dispenser system wherein the server who
15 dispenses the serving does not have access to the cash register system, *i.e.* POS system user interface. The second procedure may occur when a server, *i.e.* a table runner or second server, serves a serving prior to a check being opened for a particular table and the server does not have authority nor knowledge to manage a cash register system, *i.e.* POS system user interface.

20 The procedure of matching may be performed by a preferred method of a matching, as described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby
25 incorporated by reference.

30 A cash register system, *i.e.* POS system user interface, may consist of preferred cash register system as described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference.

In a preferred embodiment the method of the present invention uses the TABLE # as the common factor by which dispensed servings are held accountable for

payment by the server who at some point opens a bill for that table. The TABLE # may be entered as the destination information of a user or by both the waiter and server. The user may enter the destination information as part of the dispensing information using a keypad, keyboard, touch screen or stylus pad. If the waiter and 5 server both enter the same destination information, then a valid link may be established.

The waiter may capture a variety of information, using a computer, cash register, POS system or dispensing system, that may be used when the software 10 program runs the matching step. The waiter may capture identification information consisting of a server's name, unique server number and assistant's information to the server. The register computer may also capture the dispensing information of type of serving and number of servings that are flagged as refill servings. The waiter may also capture the destination information of location, which the register computer may 15 use to create the check. The waiter may also capture additional data information such as time, including second, minute, hour, day, month, year, *etc.*, and the check number. The additional data information may be used to further match the serving dispensed to the appropriate check. The present invention may also work when one person or user performs the functions of the waiter as well as the server.

20

In a preferred method of the present invention, the server may capture a variety of information that may be used when a software program processes or runs a matching step. The server may capture identification information consisting of the server's unique number and the time the identification information was entered. The 25 server may capture dispensing information consisting of the dispensing apparatus that dispensed the servings, the number of servings, the time the dispensing information was entered, the quantity of servings dispensed, the time serving were dispensed based on an allocated time period, *etc.* The server may capture destination information including the location of where the serving is to be delivered.

30

In a common scenario the server may be required in the present invention to identify the server, preferably using a magnetic card. The server may also use a bar code, password, or PIN to identify the server. The server's fingerprint or other biometric may also be used to identify the server. The server is also required to enter

the amount desired quantity or number of servings and the TABLE # for which the serving is being dispensed. The server may enter this information using a keypad, keyboard, touch screen or stylus pad. Either a bill for that table is already opened, or will be opened. The bill is opened at the cash register or POS terminal. The waiter 5 opens the bill through standard procedures that are well known in the art. Whether the bill is open or will be opened is not of major relevance to the matching procedure. What is important for one method of linking is that the dispensed serving is recorded and tagged to a location, preferably using destination information, and/or to a runner, busboy, waiter or server, preferably using identification information.

10

A bill may be opened when dispensing system matches the dispensed serving to the destination information. The dispensing system matches the server with the dispensing action based on the location information for the serving. A preferred method of matching is described in co-pending U.S. Application Serial Number 15 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference. The server may also collect the amount of payment on the bill for the servings.

20

Even if the dispensing system or dispensing apparatus is directly connected to the POS, the dispensed servings may be posted to a bill to be collected for payment and the present invention accomplishes the posting of a dispensed serving to a bill through the destination information, *i.e.* table number-the common factor.

25

When selling servings, a business or owner may be desire for the dispensing system of the present invention to determine which servings should be "FOR PAY" and which are "REFILL NOT FOR PAY". A dispensing system may require payment for all servings, including refills, dispensed for any particular table within an allocated time period, *e.g.* several minutes, of a bill being opened for a location, *i.e.* table. A preferred default is 30 minutes, which may be adjusted by waiter or owner of the place of business to any length of time. In a preferred method of the present invention, a software program may be used to monitor the refills dispensed by a dispensing system. A software program may perform the matching step to determine refill servings by following a set of logical and mathematical commands and rules. A 30

matching process that a software programs uses may require the software program or dispensing system to access information contained within the storage medium or dispensing system. A preferred method of matching is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference.

10 FIG. 11 is a flow chart that illustrates a matching process of one preferred embodiment of the method of the present invention. In FIG. 11, the matching process begins with step 1100 with the dispensing system dispensing a first serving as a "for pay" serving. In step 1100, all subsequent servings dispensed within a configurable allocated time period of the first serving are processed by the matching process as "refill" servings. In step 1100, the total number of "for pay" servings and "refill" servings are calculated. In step 1102, the matching process retrieves the POS check by getting the table number in step 1104. The table number may be entered as destination information. In step 1102, if the matching process cannot retrieve a POS check then the process returns to step 1100. In step 1106, the matching process checks for any un-matched servings for the table number. If there are un-matched servings then the process is return to step 1100 to match the servings. If there are no un-matched servings, then the matching process, in step 1108, loops through and processes all un-matched servings for the table as rung up servings. In step 1110, if the rung up servings are equal to or less than the "for pay" servings then the matching process ends in step 1112. If the rung up servings are greater than the "for pay" servings then the matching process in step 1114 sets an alert condition, and the process ends in step 112.

30 One way to determine the number of refill servings is to have each serving appear on a corresponding bill for the location the serving is delivered to by the user. This first method may be used in conjunction with the second method or third method for determining refills. Any additional serving, whether flagged as refill or not, that are dispensed with an allocated time period after the first serving may also appear on the same bill. A software program may set an alert condition, *i.e.* an indication, preferably visual, when the serving dispensed is not paid for and/or the serving does

not appear on a corresponding bill. An alert condition may notify the user, the assistant to the user, the controller of the dispensing apparatus, *i.e.* management or headwaiter, or the owners of the business. An alert condition may be ends when a user or another authorized person collects the outstanding payment to satisfy the bill
5 error that started the alert condition. A preferred alert condition is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference. In addition, the software program may flag servings that do not produce an alert condition as a for
10 pay serving. While servings that do produce an alert condition may be flagged as a refill serving.

Another method for determining the number of refill servings is to take the total number of servings dispensed for a particular location and using a mathematical
15 formula to determine the number of servings that are refill servings. This second method may be used in conjunction with the first method or third method for determining refills. Preferably this is done by subtracting the servings flagged as "FOR PAY" from the total number of the servings. Alternatively, the "FOR PAY" serving may be indicated in the dispensing information. The remainder is the total
20 number of refill servings that were dispensed. A software program or dispensing system may total the number of servings that were for "FOR PAY" and locate an appropriate price for those servings, and may total the number of servings that were for "REFILL NOT FOR PAY" and locate an appropriate price for those servings. An owner of the business may determine an appropriate price for a serving or dispensing
25 system may vary according to the number and/or quantity.

Another method for determining the number of refill servings may be that a software program performs the matching process by evaluating the "FOR PAY" servings delivered to a particular location, using the destination information and the
30 bill started for that same particular location. This third method may be used in conjunction with the first method and/or second method for determining refills. The software program places the remaining numbers of servings on that bill, which do not appear or are flagged as "FOR PAY" servings, as servings that are "REFILLS NOT FOR PAY." When there appears to be zero remaining servings for a location and/or

bill, the user is prompted to send the bill to the customer for collection of payment. An outstanding balance may be set as an alert condition to notified the authorized individual who monitors the dispensing system. When no bill exists for a location, and at least one serving is flagged as a "FOR PAY" serving then a software program 5 may start a new bill for that location and place the remaining number of servings for that location as "REFILLS NOT FOR PAY."

When determining refill servings using the above described preferred methods, a software program may determine by using one or more methods that there 10 are no refill servings for a location or that the customer is done consuming servings and desires a completed closed bill. When a bill is marked as a closed bill, a software program will no longer perform the matching methods for determining refills. In such cases, a bill may be required to be presented to the customer to satisfy outstanding payment. In alternative method of the present invention, the bill may be a line of 15 credit, which the amount of payment is collected at a later time. A software program may end the matching process for refill when the location is closed by a user or server. A user may close the location in a variety of ways, for example by entering information in the dispensing information and/or destination information or by switching the dispensing apparatus to an off-state. The present invention also 20 envisions the capability to split the bill at a location among several customers, as desired. Subsequent bills may be created for the same location.

The software program through a matching process may determine anomalies that may appear on the bill or on a dispensing activity report generated for the 25 dispensing apparatus. Such a dispensing activity report may be generated from information about dispensing activity for the dispensing system stored in the storage medium or warehouse database for the dispensing system. These anomalies may be reported to the user or owner of the dispensing apparatus. When an abnormality is detected, an alert condition may notify at least the user or waiter of the possible error.

30 Using the information in the register computer, dispensing computer and software program a report to analyze the serving that is dispensed may be created. Preferably, the report would resemble a standard spreadsheet or a database in a spreadsheet view. The spreadsheet may include across the top of the report the

following: average ratio of total servings flagged as "REFILL" to those flagged as "FOR PAY"; average ratio of servings flagged as "REFILL" to those flagged as "FOR PAY" for a particular user; average ratio of the total number of locations and number of bills that did not receive a serving; and average ratio of locations and number of bills that did not receive a serving for a particular user. The information in the rows may also span a period of time that may be configured by the person who desires the report, such as the owner. Preferably a bill cycle, such as two weeks or one month, may be used as the measurement of time. The spreadsheet may include in each column the following: user's name, assistant's name, location, table number, time of date of entering identification information, type of serving, number of servings flagged as "FOR PAY," indicating a for pay serving; number of servings flagged as "REFILL," indicating a refill serving; and unpaid servings. Additional information in the column may be entered as necessary to complete the report.

15 The result of using a spreadsheet software program of the present invention, is that the present invention achieves three distinct pieces of information automatically: determining when a "FOR PAY" serving has been dispensed; determining when a "REFILL" serving has been dispensed; and determining the average refill ratio per table and per server over a length of time.

20 In addition, a software program may be used to activate each dispensing apparatus on a multi-dispensing apparatus when a server orders a certain amount of a serving. Each dispensing apparatus that has sufficient servings to satisfy the certain amount of a serving are activated, those that do not have enough serving are not activated. When the dispensing information has been entered at the POS system or dispensing system, each dispenser apparatus that are enabled blink indicating they are ready for service. In the normal state, the dispenser apparatus do not blink because the dispensing apparatus is locked. The server may use any one of the dispensing apparatus and dispense the pre-ordered/paid for serving. Upon the pre-ordered 25 serving having been dispensed, all the other dispensing apparatus that were blinking shut off. The advantage of this system is that the server is not limited to selecting on dispenser apparatus that may or may not still have enough of a serving in it but is free 30 to select the dispenser with enough servings to satisfy his or her order.

A preferred method of monitoring a dispensing system of the present invention, may also be used to control the method for dispensing a serving. The monitoring system may monitor at least a single serving dispensed from a dispensing container. Also, the monitoring system may monitor multiple servings dispensed 5 from a dispensing container. Also, the monitoring system may monitor multiple servings dispensed from a multi-dispensing container. The monitoring system may monitor servings that are flagged as "FOR PAY" or "REFILL". The monitoring system may monitor a number of servings simultaneously and track each individual serving separate from the rest of the servings. A preferred method of monitoring 10 described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference.

The user may enter identification information on the dispensing container. A 15 user may enter the identification information in a variety of ways as described above. One such method is to use biometrics or bio-sensing device to scan a user's fingerprint on the side handle of the dispensing container. FIG. 12A, shows a perspective view of a dispensing container 1200 as constructed in accordance with an embodiment of the present invention. Dispensing container 1200 may have a handle 20 1202 with a keypad 1204 and a bio-sensing device 1206. A user, such as a server, may pick up dispensing container 1200 by handle 1202. While lifting dispensing container 1200, the user may enter identification information by scanning the user's thumbprint on bio-sensing device 1206. In addition, the user may enter identification information by entering a PIN on keypad 1204. The user may also enter dispensing 25 information on keypad 1204.

Dispensing container 1200 has handle 1202, a body 1208 for holding servings, a spigot 1210 for dispensing servings and a top 1212. Top 1212 may be removed by unscrewing top 1212 to add additional servings into body 1208.

30

FIG. 12B is a cut-away side view of a portion of dispensing container 1200 as constructed in accordance with an embodiment of the present invention. A solenoid 1214 pulls on an actuating arm 1216 that rotates at a rocker hinge 1218 to move actuating arm 1216 away from a seal 1220. Once seal 1220 is moved, a user may tilt

dispensing container 1200 by pour the servings from body 1208 through seal 1220 and out spigot 1210. The user may pour the serving once valid identification information has been entered on keypad 1204 or bio-sensing device 1206. Alternatively, the user may pour the serving once valid destination information has
5 been entered on keypad 1204. Destination information may also be entered automatically by a system that triangulates the location of dispensing container 1200 in the place of business and compares that location to pre-entered data of the same place of business. The triangulation may be done through a conventional wireless communication link, such as a RF, GPS, or similar communication link.
10 Alternatively, destination information may be entered automatically by touching a sensor on the table where dispensing container 1200 is being used. The destination information may then be sent via a communication link, wired or wireless, to a host system.

15 The triangulation of the dispenser container is preferably performed by conventional trigonometric operations for finding a position by means of bearings from at least two fixed points, which are a known distance apart. For example, in the restaurant seating area, the server may move from table to table with the dispensing container in hand, and two sensors that are fixed in the room would monitor the
20 movement the dispensing container. Once the dispensing container is in used, *i.e.* by entering valid identification information or in a readied state, the triangulation function of the dispensing system would calculate the destination information based on the position, or angles, of the dispensing container from the two fixed sensors. The sensors may also be placed outside the place of business, which may be useful when a
25 business has tables that are on a patio or located in open space. The position that the dispensing system triangulates may be compared against known locations to accuracy determine where the user is dispensing a serving at and which table number should be used when entering the location. The known locations may be stored in a storage medium.

30 Alternatively, the destination information may be entered automatically by means of a touch sensor that is activated on the table when a waiter, server, or user is pouring or dispensing the serving from the dispensing container. For example, a waiter may set down a dispensing container on a touch pad, which would send an

automatic message to the dispensing system containing the destination information. The sensor may also be a bar code reader that reads a bar code on the dispensing container at the table. The table's name or number may then be used as the location and recorded as destination information.

5

The user may enter dispensing information at the dispensing container primarily consisting of destination information and a PIN. The destination information provides the location of the customer to whom the serving is to be delivered to by either the user or an assistant to the user, such as a table runner. The 10 PIN may be linked to the register where the dispensing information was previously entered during the sale transaction, *i.e.* the POS. When the PIN is entered, as dispensing information, the previously dispensing information may later be identified during the matching process. Alternatively, a user may enter dispensing information related to the serving at the dispensing container. A user may enter the dispensing 15 information in a variety of ways as described above. One such method is to use a simple numeric keypad on the side or handle of the dispensing container to enter dispensing information.

The user may dispense the serving from the dispensing container by tilting the 20 dispenser container. Preferably, a server or waiter would dispense servings from a dispensing container. A motion or tilt sensor may measure and record as measurement data the information related to the serving that is dispensed. A motion or tilt sensor may be located on the dispensing apparatus. Such measurement data may include the type of beverage, time of tilt or pour, angle of tilt, force of tilt or 25 pour, amount of servings left in the dispensing container, *etc.* When a serving is dispensed or poured, the time, hour, minute, second, day, month, year, *etc.*, is recorded as an identifier for the measurement data.

The dispensing container does not allow a user to pour or dispense a serving 30 when no dispensing information or destination information has been previously entered. When a user attempts to dispense without the proper dispensing information or destination information, an alert condition, such as a light or sound will indicate an invalid dispensed serving. A pager, which the head bartender, other user or owner, wears may also beep when an invalid serving is attempted to be or has been

dispensed. In addition, the visual audit system may capture a video image of the user attempting to improperly dispense a serving.

Alternatively, when a user attempts to dispense an invalid serving, by not 5 entering dispensing information or destination information, the dispensing container may lock. The lock may involve shutting down the entire dispensing container so that no user may use the dispensing container until the system is unlocked by the authorized personal. In addition, the entire multi-dispensing container may lock when 10 one dispensing container has an alert condition. When the dispensing container is locked, the alert condition may also flash a light, sound an alarm or both. The alert condition may also be recorded in the warehouse database or similar device for further analysis.

After a serving is poured or dispensed, the dispensing container then 15 communicates using a communication link, such a wireless or cable device, to transfer the communication data, which may include identification information, destination information, dispensing information, measurement information, *etc.*, to the software program. Preferably a conventional wireless communication link, such as a RF, is used to communicate with a computer or host system.

20 The software program that receives the communication data then accesses the register data. At the register the user enters dispensing information that relates to the serving that is to be or has been dispensed, including the destination information, and a unique identifier of the user, such as a user number. Each piece of this information 25 forms the register data. The register data preferable is stored in a readily accessible storage medium. The software program than reconciles the communication data with the register data by matching the location, as part of the destination information that is stored in both the communication data and register data. The dispensing system creates a bill that shows the servings dispensed for a particular location. If a bill has 30 been previously created for that location, then the software program will add the new serving dispensed to that bill. A refill serving when entered as a new serving on a previous bill may also alert the user to the possibility of an invalid serving.

The monitor system also includes a visual audit system, which allows a

controller, *e.g.* the manager or owner of the business, to inspect the activities of the users each dispensing container. The controller may also be another user that is authorized to inspect the dispensing operations. The visual audit system and the results that are generated may be displayed on a computer screen or similar interface or printed to a hard copy, such as a report or receipt. A preferred method of a visual audit system is described in co-pending U.S. Application Serial Number 09/733,719 entitled "Service Transaction Monitoring System, Method and Device" filed on December 8, 2000, the entire contents and disclosure of which are hereby incorporated by reference.

10

The visual audit system operates by capturing video images of serving that is dispensed. The video images may be digital. The video images may be a still image, single frame images or a continuous video. The video image may be captured using a small digital recorder that sends the images wireless to a host system. The video image may also be captured using a standard video recorder that is uploaded to a host system as digital images. The video image may be captured for no shorted could be just an image than the duration of the pouring or dispensing of the serving. When a video image is captured, the time, *i.e.* hour, minute, second, day, month, year, *etc.*, is recorded as an identifier for the video image. The point with the video is that it is linked to the pour event and thus easily audited simply by clicking on the pour event to see the video relevant to that event

25 The visual audit system links the video images of a serving with information and data related to that same serving. The link is preferable accomplished by using the common time that is recorded when the serving is dispensed and when the video image is recorded. This time identifier may be found in the measurement data and on the video image. The image/video may well be triggered by the pour event.

30 The visual audit system allows a controller to select a type of serving, *e.g.* a brand name of a serving like COCA-COLA®, that has been poured and automatically view the video images and communicated data of that particular dispensing of the serving. The video image may be still thumbnail images on the screen. The controller may view by selecting a type of serving that has been poured and automatically view dispensing data of the selected type of serving's activity. The

controller may view by selecting a type of serving that has been poured and automatically view dispensing data of the selected type of serving's activity by selectable quantity volume, or pour or tilt duration.

5 The visual audit system allows a controller to click and drag dispensing data to a video image file and the visual audit system automatically links the two items. A manual link may be used for post service auditing and correction. The controller may also click and drag dispensing data to payment data and the system reconciles the two items. The controller may click and "unmatch" a previously reconciled dispensing data to a payment.

10 The video auditing system may also work by displaying a form, consisting of a grid and check boxes, on the computer screen. On or more grids contain various types of communication data, such as identification information, destination information, dispensing information, measurement information or any information that is communicated from the dispensing system. Alternately, when many video images are selected thumbnails of those video images may fill the screen with the communication data and the check boxes appearing visually underneath each image. The check box may consist of the following options: show this image the image is showing already with the thumbnail; show all pours and video images of type of serving on the present shift; show all pours and video images of a configurable category on the present shift; show all pours and video images of a certain selectable duration on the present shift; bad match or unmatches a previously reconciled serving; and good match, which is the default if no other box is checked. The user may check the appropriate boxes while conducting the visual audit.

15 Typical universal dispensing heads on dispensing apparatus, such as coffee and other urns, are engineered with a handle that pulls up on a spring loaded valve when the handle is tilted. In an alternative embodiment of the present invention there is a dispensing apparatus control device that has a unique solenoid/mechanical interface that replaces the handle, and hooks into the valve eyelet into which the handle is normally hooked, as shown in FIGS. 7A, 7B, 7C, 8 and 9. When activated the solenoid interface pulls up on the existing valve structure much as the handle does.

An advantage of the dispensing apparatus control device of the present invention is that it may easily be retrofitted to an existing dispensing apparatus by unscrewing dispensing head and handle, and screwing in the dispensing apparatus control device, as shown in FIG. 10. The dispensing apparatus control device may be retrofitted to an existing dispensing container, such as a coffee pot, by mounting the dispensing apparatus control device, as shown in FIGS. 12A & 12B.

The present invention will now be described by way of example:

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EXAMPLE 1

This example describes the present invention when the user is an employee of the dispensing apparatus's owner or location where the apparatus is located who is serving a customer at a business. This example shows how the method of the present invention may be performed when a server operates the dispensing apparatus and delivers a number of refill servings to a customer.

The server, typically an employee of the business, obtains dispensing information, such as type, quantity and number of servings, from a customer at the customer's table. In the present example, a user purchases, in a POS transaction, a refill large, twenty-ounce, cola beverage. The server then enters the dispensing information into a register, after entering identification information into the register by swiping the user's credit card. The dispensing apparatus is now in a readied state.

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The cash register prompts the server to enter the dispensing information, such as type, quantity, and number of servings. The server enters the dispensing information by striking keys on a keypad that is connected to the register. The keys on the keypad are predetermined keys, *i.e.* by hitting the key "20 oz." the quantity of twenty ounces is entered as dispensing information. The user may type in twenty-ounces using a keyboard or use a stylus pen to write on a stylus pad. Other pieces of the dispensing information consists of: number, flagged as a refill for two; location, TABLE A4; and the type of soft drink, cola. The server calculates, through an automated process, the amount of payment needed to complete the desired quantity

and number of servings. The register enters the amount of payment required to satisfy the servings purchased. The server chooses which payment option is desired. The location, amount of payment and the payment option creates the destination information. The register assigns which dispensing apparatus is to be used in dispensing the serving and this information is entered as the final piece of dispensing information. All dispensing information, quantity, type of beverage, number, location of a user, payment method, and dispensing apparatus, creates the dispensing information that is stored in the storage medium. The destination information is also stored on the storage medium.

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The dispensing apparatus in a readied state, now attempts to match the dispensing information to the destination information. Once the dispensing apparatus makes a success link between the dispensing information and destination information, the dispensing apparatus is placed in an activated state. The server proceeds with the container to the appropriate dispensing apparatus to begin dispensing the serving.

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The multi-dispensing apparatus dispenses five types of soft drinks, including cola. The cola dispensing apparatus is a part of the multi-dispensing apparatus. A light on an activation button on the dispensing apparatus, located above the valve, will be turned on to indicate the valve is activated. The button is located in directly above the valve, to assist a user in operating the dispensing apparatus. The light also indicates "FOR PAY" or "REFILL" as authorized by the dispensing information based on the identification code. The server places the container under the valve, and presses the activation device that corresponds with the appropriate serving. The serving is then dispensed from a bin through a valve into the container. The valve will remain open for an allocated time period according to the calculate time to quantity chart table to calculate the quantity to be dispensed, and controls the serving. Once the serving is dispensed, the dispensing apparatus directs the server to the appropriate table number to take the serving through a printed receipt.

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The serving being dispensed is cola, which is consumed as a cold beverage. This requires the dispensing apparatus's bin to be kept cool. In addition, another dispensing apparatus, which dispense cubed ice, is also part of the dispensing apparatus. The cubed ice dispensing apparatus does not require activation because the

cubed ice is not being controlled or monitored.

If the server does not press the activation device within the allocated time space, then the light will be shut off and the server will need to begin the dispensing process over by scanning in the identification information. The business that owns, controls, or operates the dispensing apparatus, may set the allocated time space to a desire amount instead of using the default value of fifteen seconds. If the server presses an activation device that is not activated by the dispensing information based on the destination information, then no serving will be dispensed and the server will need to begin the dispensing process over by scanning the identification information.

Once the serving is dispensed in the desired quantity, the valve is disabled and the light is shut off, the timer is reset for the next serving. The dispensing apparatus is placed into a stand-by state from an activated state. The identification information, dispensing information and destination information related to the servings dispensed is recorded in the warehouse database. The serving dispensed is also recorded on the bill, so that the server may presented the check to a user at the appropriate time.

As with the present cola dispensing apparatus, when a desired serving is low on a particular serving, the dispensing apparatus will notify an employee to add more servings to the bin. The cola dispensing apparatus signals an employee to add servings to the amount of servings stored in the bin.

After the customer is finished consuming the beverage and desires the second serving, the server may return to the dispensing apparatus to dispense the second serving as a refill into the same holder container.

Each time a refill serving is accessed, the server scans the server's identification information. The dispensing apparatus is now placed in a readied state from its previous stand-by state. The dispensing apparatus matches the dispensing information to destination information and checks the dispensing information for a refill serving. Once the refill serving is found, the dispensing apparatus is an activated state. The server may then proceed in the same manner with dispensing the beverage as was previously done.

The refill process is repeated until the grace time period for refills expires. Even though the customer purchases two servings, the customer may use those servings at any time within the grace time period of two hours. A light indicator is 5 used to show when the dispensing information, including refill serving, based on destination information reaches the threshold for number of servings or when the time period has expired. If the server attempts to dispense an additional serving, the dispensing apparatus will not activate. An alert condition will be placed on the identification information and destination information to notify management of a 10 possible error in dispensing serving. The controlled method of dispensing servings prevents fraud and abuse by users and servers who deliver servings to a customer.

EXAMPLE 2

15 This example shows how the method of the present invention may be performed when a customer operates the dispensing apparatus to deliver a number of refill servings.

20 A customer buys a refill serving at a register of a business. The employee at the register enters into the register that the customer's name is Susan Smith and that the customer purchased a refill twelve ounce coffee at 8 AM. The employee prints 25 out a bar code label and attaches the label to a twelve ounce cup. The bar code label indicates that the customer is entitled to a refill serving of twelve ounces from the coffee dispenser and that the customer may obtain refill servings for one hour, until 9:00 AM.

30 The customer places the cup in the appropriate place in the coffee dispenser so that a scanner on the coffee dispenser is able to read the bar code, putting the coffee dispenser in a ready state. A pushbutton on the coffee dispenser lights up, indicating that the customer may dispense coffee. The user pushes the button and a serving of coffee is dispensed.

In order to obtain a refill, the customer places the cup again in the proper place in the coffee dispenser and presses the push button. After one hour, the coffee

dispenser will no longer be put in a ready state by the cup being placed in the coffee dispenser.

EXAMPLE 3

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This example describes the present invention when two users, a waiter and server, serve a customer a serving at a business. This example shows how the method of the present invention may be performed when a server operates the dispensing apparatus and delivers a number of refill servings to a customer, while a waiter opens

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a bill.

As a customer sits down at a table in a restaurant a server, *i.e.* table runner, takes the beverage order of the customer. The server then approaches the dispensing apparatus to get the order. The server enters identification information by swiping a magnetic strip and enters dispensing information and destination information, including location, *i.e.* table #, using a touch screen. The server places the container under the corresponding valve of the dispensing apparatus and presses an illuminated activation device directly above the corresponding valve to dispense the serving. The server delivers the dispensed serving to the customer.

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The waiter then proceeds to take the rest of the order from the customer. The waiter proceeds to open a new bill for the customer. The waiter enters the destination information as part of the new bill. The dispensing system then searches for servings that were previously dispensed with the same destination information. A successful search produces a valid match. Each additional serving, *i.e.* refills, which the server dispenses, appears on the bill because of the match between the destination information.

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Once the customer is finished, the waiter may present the customer with the bill showing each serving that was dispensed. The waiter collects the appropriate payment and the bill is satisfied.

The information from the servings that were dispensed is recorded in a warehouse database and may be used to reorder additional serving. In addition, the

information is recorded on a dispensing activity report for the owner to review the status of the server's activities.

EXAMPLE 4

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This example describes the present invention when two users, a waiter and server, serve a customer a serving at a business. This example shows how the method of the present invention may be performed when a server operates the dispensing container and pours a number of refill servings to a customer, while a waiter opens a bill.

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As a customer sits down at a table in a restaurant a server, *i.e.* table runner, brings a dispensing container to the customer's table. Prior to bringing the dispensing container to the customer's table, the server enters identification information by swiping a magnetic strip. The customer requests the serving from the dispensing container to be poured. The server tilts the dispensing container to pour the serving. A sensor measures the poured serving and records the measurement. In addition, a RF communication device on the table communicates to the dispensing container the destination information. When the RF communication device on the table is disabled or not functionally properly, the server could manually enter the destination information. A light indicator on the dispensing container may alert the serving to the improper status of the RF communication device. Once the serving is completed, the measurement information along with the destination information is sent via a wireless communication link to a host system.

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The waiter then proceeds to take the rest of the order from the customer. The waiter proceeds to open a new bill for the customer. The waiter enters the destination information as part of the new bill. The dispensing system then searches for servings that were previously poured with the same destination information. A successful search produces a valid match. Each additional serving, *i.e.* refills, which the server pours, appears on the bill because of the match between the destination information.

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Once the customer is finished, the waiter may present the customer with the bill showing each serving that was dispensed. The waiter collects the appropriate

payment and the bill is satisfied.

The information from the servings that were dispensed is recorded in a warehouse database and may be used to reorder additional serving. In addition, the 5 information recorded on a dispensing activity report for the owner to review the status of the server's activities.

Although the present invention has been fully described in conjunction with the preferred embodiment thereof with reference to the accompanying drawings, it is 10 to be understood that various changes and modifications may be apparent to those skilled in the art. Such changes and modifications are to be understood as included within the scope of the present invention as defined by the appended claims, unless they depart therefrom.

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26. The method of claim 25, further comprising the step of timing out the dispensing by disabling said activated dispensing apparatus and returning said activated dispensing apparatus to said readied state when said button is not pressed 5 within the allocated time period.

27. The method of claim 25, further comprising the step of disabling said activated dispensing apparatus and returning said activated dispensing apparatus to said readied state when said at least one serving is dispensed into said container in accordance with 10 said dispensing information.

28. The method of claim 1, wherein said dispensing apparatus comprises a multi-dispensing apparatus.

15 29. A method for producing a bill for a dispensing system comprising the steps of:
(a) a waiter creating said bill by entering destination information into said dispensing system;

(b) a server entering identification information, dispensing information and said destination information into said dispensing system;

20 (c) linking said dispensing information to said bill based on said destination information; and

(d) producing said bill based on said dispensing information.

30. The method of claim 29, wherein step (a) is performed before step (b).

25 31. The method of claim 29, wherein step (b) is performed before step (a)

32. The method of claim 29, wherein step (b) is repeated a plurality of times.

30 33. The method of claim 29, wherein said bill is a split bill.

34. The method of claim 29, further comprising the step of dispensing at least one serving from said dispensing system.